3(9)
AUTHOR: Ponsov, A. G.

SOV/50-59-4-1[illegible]21

TITLE: Experience in the Use of Magnetic Mixers for the Titration of Sea Water (Opyt primeneniya magnitnykh meshalok pri titrovanii morskoy vody)

PERIODICAL: Meteorologiya i gidrologiya, 1959, Nr 4, pp 52-54 (USSR)

ABSTRACT: Magnetic mixers have not been in use for a long time. The EMIB mixers, a product of the testing and designing shop of the institut fiziologii im. A. A. Bogomol'tsa AN USSR (g. Kiyev) (Institute of Physiology imeni A. A. Bogomolets of the AS UkrSSR (Town of Kiyev)), are used in the laboratories. These mixers have a number of shortcomings: they are too large, require additional attachment devices, and the cylindric magnet must be cleaned from silver-chloride sediments after every titration. The author puts forward some improvements to this mixer, which eliminate these shortcomings. He suggests a particular tripod to attach the mixer direct to the table, thus eliminating the complicated attachment devices, and making the whole apparatus smaller. The cleaning, and the corresponding taking out, of the magnet are simplified by the author by the introduction of a permanent magnet under the bucket bottom; this forms a "trap" and hinders the magnet from falling

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Experience in the Use of Magnetic Mixers for the Titration of Sea Water SOV/50-59-4-13/21

out if the bucket tilts over. The design of the mixer and the improvements of the author are described in detail. In tests, the tripod and the "trap" proved to be very useful and convenient. There are 2 figures

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5(1)
AUTHOR: Ponsov, A. G. SOV/32-25-3-57/62

TITLE: Magnetic Trap for Titration in Magnetic Stirring Apparatus (Magnitnaya lovushka dlya titrovaniya s magnitnymi meshalkami)

PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, Nr 3, pp 380-381 (USSR)

ABSTRACT: The working principle of magnetic stirring apparatus is based on the interaction of two permanent magnets. One of them is attached to an electric motor, the other is in a glass vessel in which the titration takes place. The titration being finished, the magnet contained in the glass vessel has to be removed. In the present case it is proposed to attach beneath the glass vessel a third magnet whose task is to hold the magnet in the vessel while the liquid is removed. The trap with the third magnet (Fig) is, basically, a second vessel attached to the titration vessel and made of paramagnetic material. The application of the trap described is especially recommended for precipitation titrations. There is 1 figure.

ASSOCIATION: Gosudarstvennyy okeanograficheskiy institut (State Oceanographic Institute)

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PONSOV, A.G.; ANDREYEV, N.B.

Small magnetic mixer for chlorine concentration determination in sea water by titration. Trudy GOIN no.59:114-117 '61. (MIRA 14:7)

(Sea water--Analysis) (Titration)

BLINOV, L.K., nauchnyy sotrudnik; TSURIKOVA, L.K., nauchnyy sotrudnik; PAKHOMOVA, A.S., nauchnyy sotrudnik; SOPACH, E.D., nauchnyy sotrudnik. Prinimali uchastiye: PONSOV, A.G.; KALASHNIKOVA, V.V.; KIRILLOVA, Ye.P.; LOS', B.M.; LEBEDEVA, G.V.; KORNILENKO, V.G., red.; ZEMTSOVA, T.Ye., tekhn.red.

[illegible]

(MIRA 14:6)

1. Moskva. Gosudarstvennyy okeanograficheskiy institut. 2. Laboratoriya khimii morya Gosudarstvennogo okeanograficheskogo instituta (for Blinov, TSurikova, Pakhomova, Sopach).
(Water--Analysis)

PONSOV, A.G.

Electric conductivity as a characteristic of physicochemical properties of sea and river waters and a method for determing their salinity. Trudy GOIN no.49:189-198 '60.
(MIRA 13:7)
(Saline waters--Electric properties)
(Estuaries)

DEMIDOV, V.S.; ZHIZHIN, Ye.D.; KIRILLOV-UGRYUMOV, V.G.; PONOSOV, A.K.; SERGEYEV, F.M.; SHALAMOV, Ya.Ya.

Effect of the nucleus on π^0-meson production. Zhur. eksp. i teor. fiz. 45 no.3:437-442 S '63. (MIRA 16:10)

1. Institut teoreticheskoy i eksperimental'noy fiziki i Moskovskiy inzhenerno-fizicheskiy institut.
(Mesons) (Collisions (Nuclear physics)

B/056/63/044/004/004/044
B102/B186

AUTHORS: Damidov, V. B., Kirillova-Uryumov, V. G., Ponomov, A. K., Prokhnov, V. P., Burgoyov, F. M.

TITLE: Absorption of stopped negative pions in carbon

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 4, 1963, 1144 - 1146

TEXT: Previously taken photographs (ZhETF, 42, 1689, 1962) of interactions of slow π^- in a 4-liter propane bubble chamber were now used to investigate the pion absorption by carbon nuclei. Among 3500 π^- stops there were 1130 selected for an analysis of the pion star distribution with respect to prongs, and 1180 two-pronged stars for investigating the distribution with respect to the angle between the prongs. If one assumes (Phys. Rev. 84, 258, 1951) that π^- are absorbed only by nucleon pairs (pn, pp), the absorption probability may be calculated. On comparing the experimental results with those calculated by the method of least squares, the π^- absorption probability by a pn-pair amounts to 70 - 80%, that for a pp-pair to 30 - 20%, and the probability of an intranuclear collision is 60 - 80%.

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The mean number of prongs was found to be 0.04 and the distribution of stars with respect to the angle between the prongs had a sharp maximum at about 180°. The results speak in favor of the two-nucleon absorption mechanism. The absorption probability is energy-independent in the range 0 - ~200 Mev. There are 1 figure and 1 table.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Institute of Physical Engineering)

SUBMITTED: November 2, 1962

ACC NR: AT7008898 SOURCE CODE: UR/0000/66/000/000/0076/0082

AUTHOR: Alikhanyan, A. I.; Aleksanyan, A. S.; Verebryusov, V. S.; Voremoyev, M. M.; Demidov, V. S.; Kirillov-Ugryumov, V. G.; Protasov, V. P.; Ponosov, A. K.; Sergeyev, F. M.

ORG: none

TITLE: Bubble chamber designed to operate in a magnetic field

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Fizika elementarnykh chastits, 1966, 76-82

TOPIC TAGS: austenite steel, bubble chamber, pi meson, synchrotron, photography

SUB CODE: 20, 14

ABSTRACT: The article describes a bubble chamber with an effective volume of 200 liters made of nonmagnetic austenite 1Kh18N9T steel and consisting of a permanent outer vessel and the working chamber proper located inside it. The design of the inner chamber, outer vessel, and expander is generally similar to that described in an earlier article by A. V. Bogomolov et al. The upper lid of the permanent vessel has six windows for photography. Differential three-stage valves are used for increasing pressure and for depressurization in the chamber. The working space of the chamber is illuminated by eight out of sixteen IFK-120 flash bulbs mounted in pairs on a special panel; the lighting system design also permits the use of IFP-4000 bulbs. The photographing is done on two standard aerial photographic films, with a sensitivity of 1200 GOST [Gosudarstvennyy Obshchesoyuznyy

UDC: 539.1

Card 1/2

ACC NR: AT7006898

[Standard; All-Union State Standard] units and 80 mm width, by two "Gidrotumar-4"-type objectives. During operation of the chamber chromatic aberration was observed, resulting in a ghost effect in the particle track image. This was eliminated by photographing in monochromatic light through an experimentally chosen orange light filter. The chamber is heated by three 2-kw electric heaters, with one of the heaters set directly on the inner chamber. There are two versions of thermostat system control. The first employs a standard contact thermometer mounted in the chamber casing. The second version employs an electrocontact manometer. The article includes a block diagram of the chamber's control circuit. The chamber was tested in operation with various working fluids: propane, a mixture of Freon-12 and Freon-13, a propane-ethane mixture, and propane-Freon and propane-ethane-Freon mixtures. The chamber is at present set up in an MS-12 magnet in the path of a beam of negative pi-mesons, 4 Gev in energy, of the proton synchrotron of ITEF [Institut teoreticheskoy i eksperimental'noy fiziki; Institute of Theoretical and Experimental Physics]. The actuation cycle of the chamber is 4 seconds. The authors express their thanks to Ye. V. Kuznetsov, Ye. P. Kuznetsov, M. G. Gornov, S. M. Fyumin, A. F. FAlin, and E. S. Levonyan for their assistance and "valuable advise" and to Yu. A. Budagov for "useful discussions". Orig. art. has: 8 figures. [JPRS]

Card 2/2

L 11913-66 EWT(m)/T/EWA(m)-2

ACC NR: AP6001156 SOURCE CODE: UR/0367/65/002/003/0496/0500

AUTHOR: Veselovskiy, G.S.; Grashin, A.F.; Demidov, V.S.; Kuznetsov, Ye. P.; Ponosov, A.K.; Protasov, V.P.; Sergeyev, F.M.

ORG: Institute of Theoretical and Experimental Physics, GKIAE (Institut teoreticheskoy i eksperimental'noy fiziki)

TITLE: Production of slow pi mesons on light nuclei and the pi-pi interaction

SOURCE: Yadernaya fizika, v. 2, no. 3, 1965, 496-500

TOPIC TAGS: pi meson, pion pion interaction

ABSTRACT: The object of the study was to find the possible resonance states in a system composed of two π-mesons at low energies:

$$Q = M_{\pi\pi} - 2\mu = [(\omega_{\pi_1} + \omega_{\pi_2})^2 - (p_{\pi_1} + p_{\pi_2})^2]^{1/2} - 2\mu \leqslant \mu$$

μ being the mass of a π-meson. The statistical material was obtained by studying the production of slow $\pi^{\pm}$ mesons upon collision of π^- mesons (initial momentum 2.8 GeV/sec) with nuclei of a freon mixture in a 17- and 200-liter bubble chambers. In analyzing the films, all those cases were selected which involved interaction between π-mesons and the nuclei of the working liquid, resulting in the formation of two or more slow π-mesons which stopped in the working substance of the chamber. The Q distributions of the bipion in the range Q < 100 MeV were obtained. The distribution for $\pi^+\pi^-$ pairs differs from that for $\pi^+\pi^+$ and

Card 1/2

L 11913-66

ACC NR: AP6001156

$\pi^-\pi^-$ pairs; this may be explained by the presence of a strong $\pi\pi$ interaction in the isotopic state T = 0. Orig. art. has: 5 figures.

SUB CODE: 20 / SUBM DATE: 03Jul64 / ORIG REF: 004 / OTH REF: 001

Card 2/2

ZHIVOPISTSEV, V.P.; PONOSOV, I.N.; SELEZNEVA, Ye.A.

Possibility of concentrating and separating elements with the use of three-phase extraction systems. Zhur. anal.khim. 18 no.12: 1432-1435 D '63. (MIRA 17:4)

1. Permskiy gosudarstvennyy universitet.

PONOSOV, V.A.

Use of vertical cross sections in calculating corrections for the effect of the relief. Uch. zap. Perm. gos. un. no.122:76-80 '64.
(MIRA 19:1)

STEPIN, Vasiliy Vasil'yevich; SILAYEVA, Yelizaveta Vasil'yevna; PLISS, Anastasiya Mikhaylovna; KURBATOVA, Vera Ivanovna; KRYUCHKOVA, Lidiya Merkur'yevna; PONOSOV, Vladimir Il'ich; DYMOV, A.M., doktor khim. nauk, prof., red.; FEDOROV, A.A., st. nauchn. sotr., red.; TKACHENKO, N.S., inzh., red.; DOBRZHANSKIY, A.V., st. inzh., red.; LEVIT, Ye.I., red.izd-va; ISLENT'YEVA, P.G., tekhn. red.

[Analysis of ferrous metals, alloys and manganese ores] Analiz chernykh metallov, splavov i margantsevykh rud. [By] V.V. Stepin i dr. Moskva, Metallurgizdat, 1964. 498 p. (MIRA 17:3)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (for Dymov, Fedorov, Tkachenko, Dobrzhanskiy).

PONTE, Dumitru, ing.; MIRCEA, Leonte, ing.

The innovation work, a technical progress source. *Rev min* 14 no.1: 43 '63.

1. M.M.E.E.-D.G.M.

FALOMKIN, I.V.; FILIPPOV, A.I.; KULYUKIN, M.M.; PONTECORVO, B.; SHCHERBAKOV, Yu.A.; SULYAYEV, R.M.; TSUPKO-SITNIKOV, V.M.; ZAYMIDOROGA, O.A.; SMIRNOVA, L.A.[translator]; SARANTSEVA, V.R., tekhn. red.

Measurement of the $\Lambda^- + He^3 \rightarrow H^3 + \nu$ reaction rate. Dubna, Ob"edinennyi in-t iadernykh issledovanii, 1962. 7 p.
(No subject heading)

ZAYMIDOROGA, O.A.; KULYUKIN, M.M.; PONTEKORVO, B.; SULYAYEV, R.M.; FALOMKIN, I.V.; FILIPPOV, A.I.; TSUPKO-SITNIKOV, V.M.; SHCHERBAKOV, Yu.A.

Measuring the probability of the reaction $\mu^- + He^3 \rightarrow H^3 + \nu$; final results. Zhur. eksp. i teor. fiz. 44 no.1:389-390 Ja '63. (MIRA 16:5)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Nuclear reactions)

ZAYMIDOROGA, O.A.; KULYUKIN, M.M.; PONTEKORVO, B.; SULYAYEV, R.M.; FALOMKIN, I.V.; FILIPPOV, A.I.; TSUPKO-SITNIKOV, V.M.; SHCHERBAKOV, Yu.A.

Probability of the reaction $\mu^- + He^3 \rightarrow H^3 + \nu$. Zhur. eskp. i teor. fiz. 43 no.1:355-358 Jl '62. (MIRA 15:9)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Nuclear reactions)

PONTEKORVO, B. [Pontecorvo, B.]

Slight probability of the processes $\mu \rightarrow e + \gamma$, $\mu \rightarrow e + e + e$ and neutral currents in weak interactions. Zhur. eksp. i teor. fiz. 43 no.4:1521-1523 O '62. (MIRA 15:11)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Mesons—Decay) (Nuclear reactions)

PONTEKORVO, Bruno[Pontecorvo, Bruno]

The neutrino and its role in astrophysics. Usp. fiz. nauk 79 no.1:3-21 Ja '63. (MIRA 16:1)

(Neutrinos) (Astrophysics)

PONTECORVO, B.; SARANTSEVA, V.R., tekhn. red.

Small probability of the $\mu \rightarrow e + \gamma$ and $\mu \rightarrow e+e+e$ processes and neutral currents in weak interactions. Dubna, Ob"edinennyi in-t iadernykh issledovanii, 1962. 4 p.
(No subject heading)

OKUN', L.B.; PONTEKORVO, B.

What is heavier "muonium one" or "muonium two"? Zhur.eksp.i teor.fiz. 41 no.3:989-991 S '61. (MIRA 14:10)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Mesons)

PONTECORVO, B.; CHUDAKOV, A.Ye.

Neutrinos and the cosmic ray intensity at great depths. Izv. AN SSSR. Ser. fiz. 21 no.1 [illegible] 1957.

PONTEKORVO, B. [Pontecorvo, B.]

Neutrino physics today; summary of a report. Izv. AN SSSR. Ser. fiz. 26 no.6:737 Je '62. (MIRA 15:6)
(Neutrinos)

39680
S/056/62/043/001/055/056
B102/B104

24,6700

AUTHORS: Zaymidoroga, O. A., Kulyukin, M. M., Pontekorvo, B., Sulyayev, R. M., Falomkin, I. V., Filippov, A. I., Tsupko-Sitnikov, V. M., Shcherbakov, Yu. A.

TITLE: Measurement of the probability of the $\mu^- + He^3 \rightarrow H^3 + \nu$ reaction

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 1(7), 1962, 355-358

TEXT: The $\mu^- + He^3 \rightarrow H^3 + \nu$ -reaction probability was measured in order to study the symmetry of the muon and electron interactions with nucleons. The method used is that described in ZhETF, 41, 1805, 1961. A diffusion chamber filled with He^3 gas (20 atm) in a field of 6 koe was exposed to a muon beam (217 Mev/c) from the synchrocyclotron of the Laboratoriya yadernykh problem OIYaI (Laboratory of Nuclear Problems of the OIYaI), a copper filter being used to moderate the muons. Some 10^5 photographs were taken. The total number of captures and μ-e decay events was determined from the spectrum of the visible secondary tracks of tritium stars and also from the spectrum of the ranges of the stopped secondary

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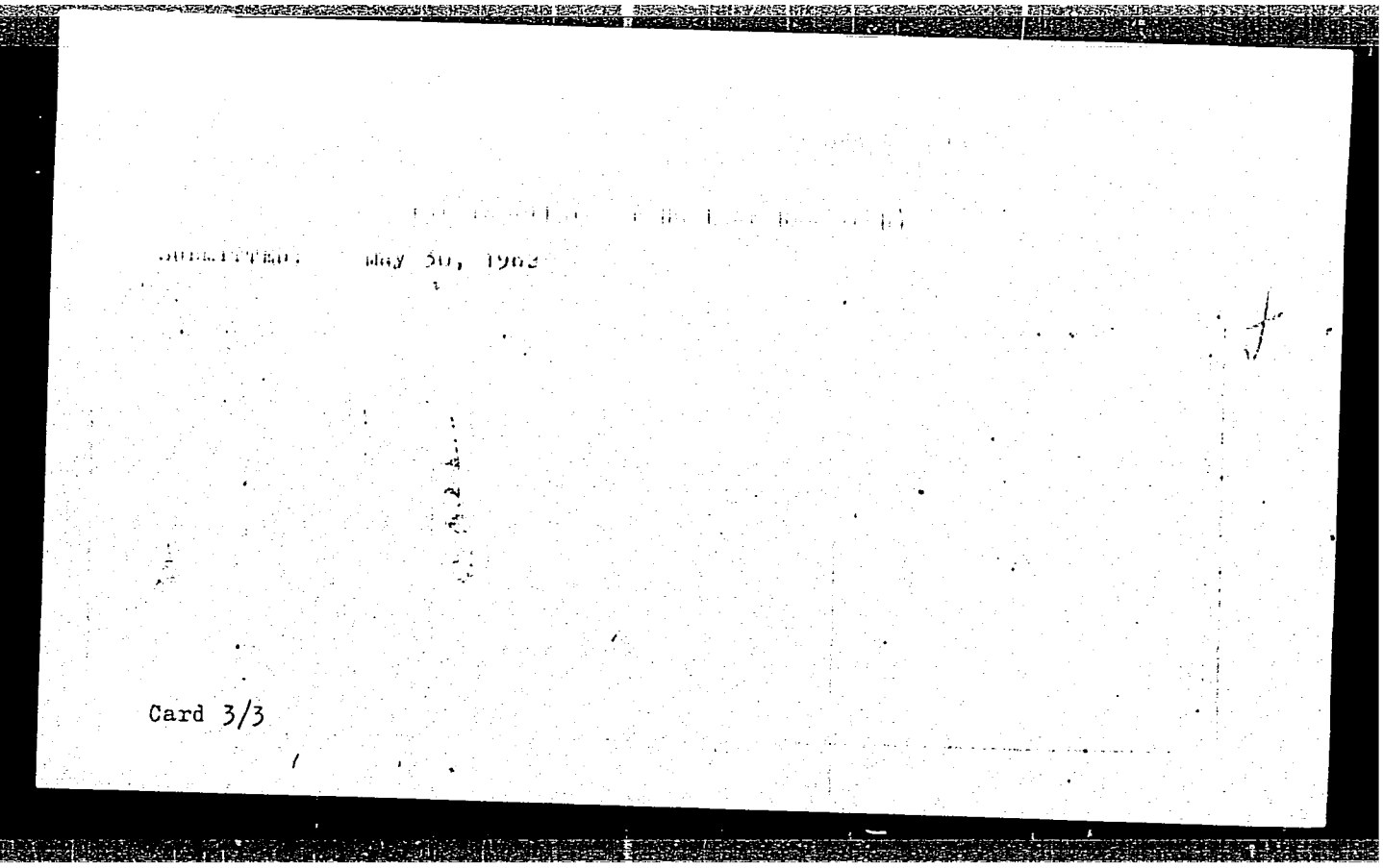
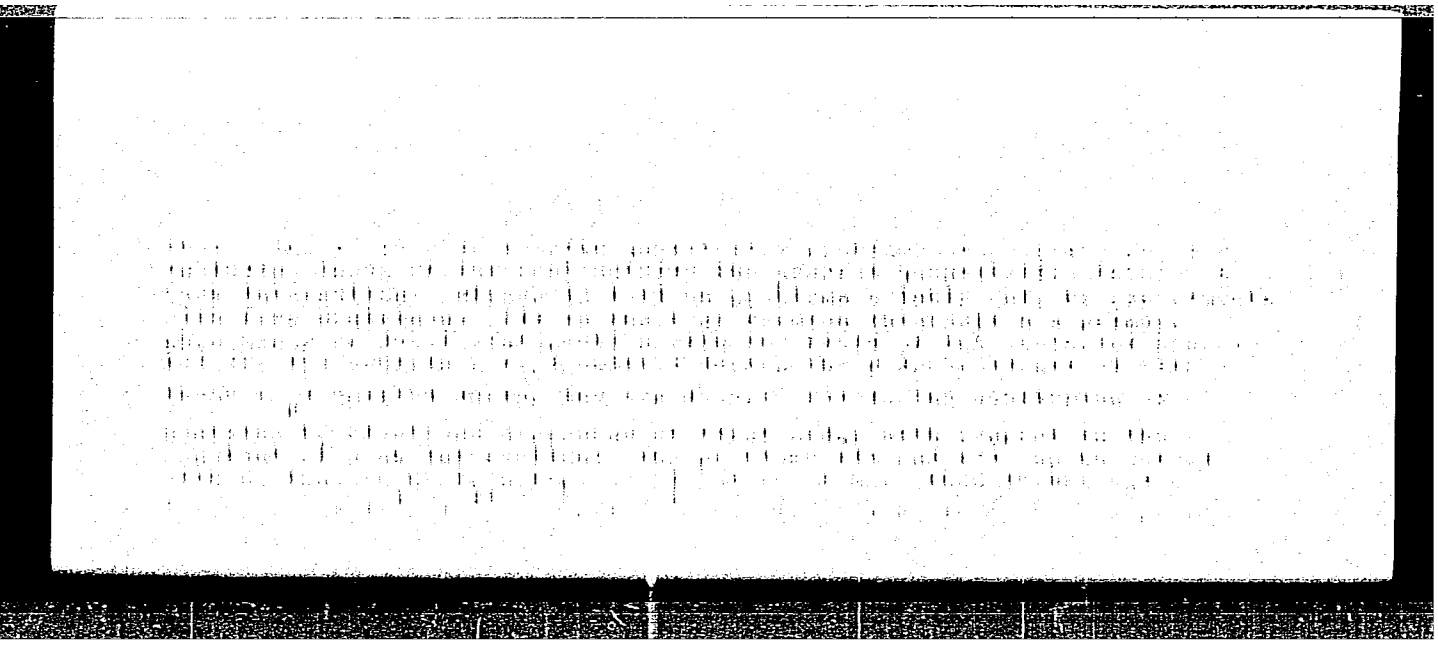


May 31, 1963

Card 3/3

PONTECORVO, B.

Neutrino and its part in astrophysics. Analele mat 17 no.4: 60-81 O-D '63.



[illegible], B. [illegible]:

Neutrinos and the density of matter in the universe. Zhur.eksp.i teor.fiz. 41 no.1:239-243 Jl '61. (MIRA 14:7)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Neutrinos) (Cosmogony)

ACCESSION NR: AT3002139 S/2918/62/000/000/0273/0282

AUTHOR: Ponte[illegible]vo, Bruno

TITLE: [illegible]

SOURCE: [illegible]

TOPIC TAGS: physics, neutrino, [illegible]

ABSTRACT: Methods of getting information on the production and behavior of the neutrino are discussed. All the presently known properties of the neutrino are reviewed, experimental data are compared with theoretical predictions, and the results tabulated. Several remarks are made in connection with the macroscopic effects of the neutrino and its excessively large penetration capabilities. Production of B-mesons by bombarding the nucleus with high energy neutrinos is discussed. The mass M of the B-meson is shown to obey the inequality $M_B \geq M_K$ to avoid the process $K \longrightarrow B + \pi$. In these reactions the presence of a μe pair is detected and considered unnatural. The relationship between ν_e (electron-

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ACCESSION NR: AT3002139

neutrino) and ν_μ (muon neutrino) is discussed. The two are shown experimentally to be two distinct neutrinos. Finally, the existence of ν_e -interactions is considered briefly. Although theoretically predicted, experimental verifications are shown to be lacking for its final acceptance. It is contended that existence of ν_e -interaction might have great astrophysical significance. Orig. art. has: 7 equations, 2 figures, and 1 table.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 30Apr63 ENCL: 00

SUB CODE: PH NO REF SOV: 000 OTHER: 000

PONTEKORVO, Bruno M.

"Origin of the Nonhomogeneity of Gamma-Radiation - Capture of Slow Neutrons," Chem. Abs., 1937

PONTEKORVO, B. M. and WICK, G. C.

"Diffusion of Neutrons," (I), Chem. Abs., 1937

PONTEKORVO, B. M.

"Absorption of Slow Neutrons," Chem. Abs., 1938

PONTEKORVO, B. M.

"Diffusion of Monokinetic Neutrons by Protons," Chem. Abs., 1938

PONTEKORVO, B. M.

"Review of Magnitude of Probabilities of Radioactive Transitions in the Nucleus," Usp. Fiz. Nauk, 1949

PONTEKORVO, B. M.

"Soft Radiation Emitted on Capture of Neutrons by Nuclei," Chem. Abs., 1939

PONTEKORVO, B. M. and LAZARD, A.

"Nuclear Isomerism Produced by Continuous Spectrum X-Rays," Chem. Abs., 1939

[redacted], G. N.

"Isomeric Forms of Radio Rh," Chem. Abs., 1940

PONTEKORVO, B. M.

"Nuclear Isomerism and Internal Conversion," Chem. Abs., 1940

PONTEKORVO, B. M. and DUNWORTH, J. V.

"X-Ray Excitation of Lutecium," Phys. Abs., 1947

PONTEKORVO, B. M., AUGER, P. and MUNN, A. M.

"The Transport Mean Free Path of Thermal Neutrons in Heavy Water," Phys. Abs., 1947

PONTEKORVO, B. M. and MUNN, A. M.

"Spatial Distribution of Neutrons in Hydrogeneous Media Containing Bismuth, Lead, and Iron," Phys. Abs., 1947

PONTEKORVO, B. M. and DUNWORTH, J. V.

"Excitation of Indium 113 by X-Rays," Phys. Abs., 1947

PONTEKORVO, B. M.

"Nuclear Capture of Mesons and the Meson Decay," Phys. Abs., 1947

PONTECORVO, B. M. and HINCKS, E. P.

"Search for Gamma-Radiation in the $\pi^+ \rightarrow \mu^+ \rightarrow e^+$ Meson Decay Process," Phys. Rev., 1948

PONTEKORVO, B. M.

"The Neutrino and the Recoil of Nuclei in Beta Disintegrations," Phys. Abs., 1949

PONTEKORVO, B. M. and KIRKWOOD, D. H. W., and HANNA, G. C.

"Fluctuation of Ionization and Low-Energy Beta Spectra," Phys. Abs., 1949

PONTEKORVO, B. M. and HINCKS, E. P.

"The Penetration of μ-Meson Decay Electrons and Their Bremsstrahlung Radiation," Phys. Abs., 1949

PONTEKORVO, B. M. and HANNA, G. C.

"The B-Spectrum of H^3," Phys. Abs., 1949

PONTEKORVO, B. M. and HINCKS, E. P.

"On the Disintegration Products of the 2.2-μsec. meson," Phys. Abs., 1950

PONTEKORVO, B. M. and HINCKS, E. P.

"On the Absence of Photons Among the Decay Products of the 2.2 Microsecond Mesons," Phys. Abs., 1950

USSR/Nuclear Physics - Heavy meson formation FD-2865

Card 1/1 Pub. 146 - 2/26

Author : Pomeranchuk, B. M.

Title : [illegible]

Periodical : [illegible]

Abstract : The author considers the processes governing the formation of V_1^0 particles and heavy mesons from the phenomenological point of view. He discusses the mechanism governing the simultaneous generation of V particles and heavy mesons, and considers the possibility of the existence of relatively stable systems consisting of nucleons and V particles. He treats in detail the difficulties connected with the demonstration of the existence of particles which are generated with great probability and have long lifetime. He notes that the conclusions obtained in the work can help formulate working hypotheses for the interpretation of experimental data and for the treatment of the possibility of setting up experiments on the formation of new particles. He thanks I. Ya. Pomeranchuk. Nine references: e.g. Ya. B. Zel'dovich, DAN SSSR, 86, 505, 1952.

Institution : Institute of Nuclear Problems, Academy of Sciences USSR

Submitted : April 30, 1955

USSR/Nuclear Physics - Hyperons FD-2960

Card 1/1 Pub. 146 - 1/28

Author : Balandin, M. P.; Balashov, B. D.; Zhukov, V. A.; Pontekorvo [Pontecorvo], B. M.; Selivanov, G. I.

Title : Possibility of the formation of Λ^0 particles by protons with energies up to 700 Mev

Periodical : Zhur. eksp. i teor. fiz., 29 September 1955, 265-273

Abstract : The authors attempt to observe the formation of Λ^0 particles during collision of protons with energies of 670 Mev with carbon nuclei. In principle the experiments permitted them to record Λ^0 particles decaying according to the following scheme: $\Lambda^0 \rightarrow$ [illegible]. They detected gamma rays from the decay of Λ^0 mesons by means of a telescope consisting of [illegible]. [illegible] Ten references, mainly western and 2 Soviet [illegible] SSSR.

Institution : Institute of Nuclear Problems, Academy of Sciences USSR [IYaP AN SSSR]

Submitted : June 2, 1955

USSR/Nuclear Physics - Mu meson production FD-3273

Card 1/1 Pub. 146 - 32/44

Author : Novikov, A. N.; Pontecorvo, B. M.; Selivanov, G. I.

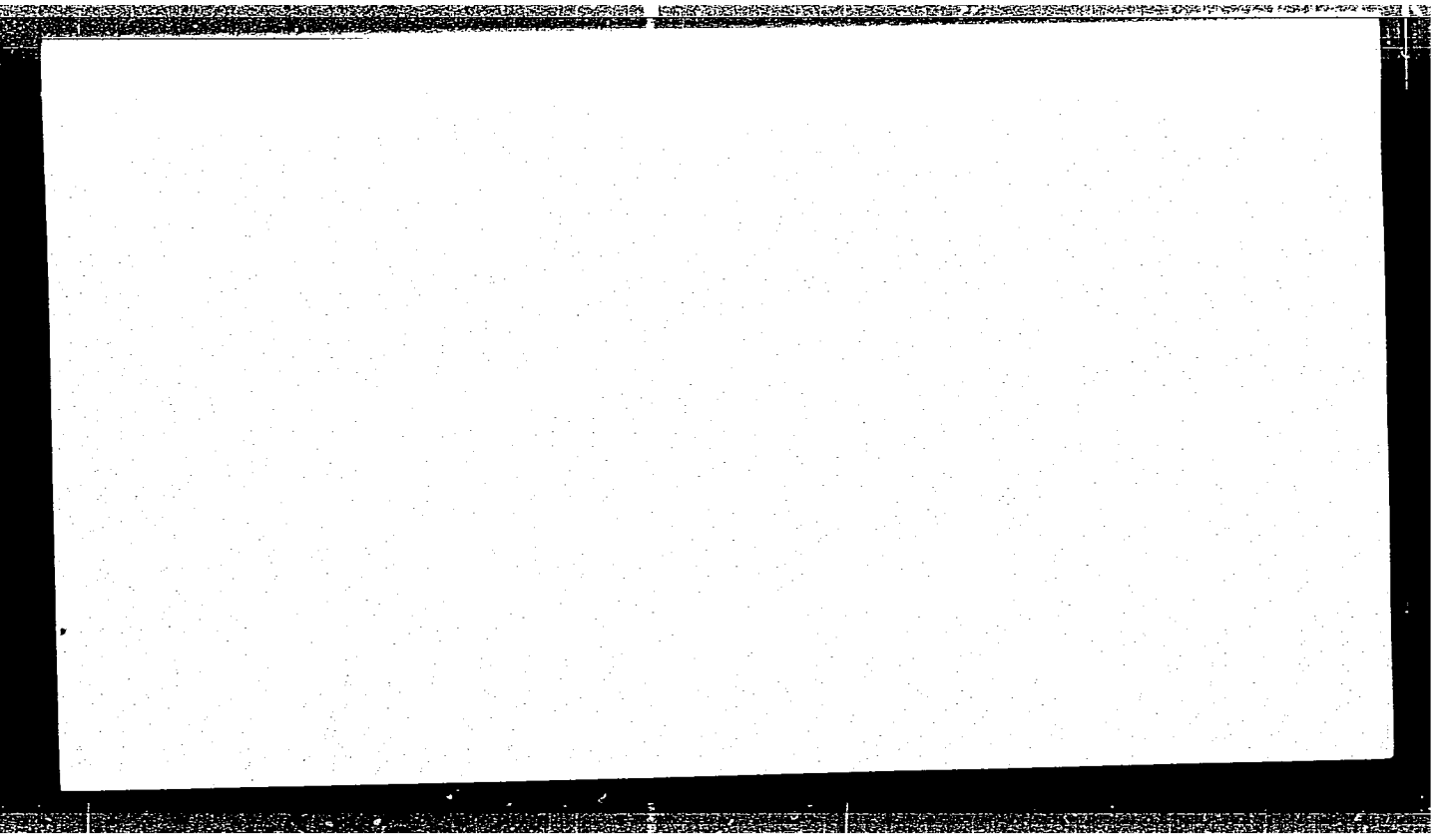
Title : Possibility of the formation of penetrating radiation (μ^0 mesons) in collisions of high-energy protons with nuclei

Periodical : Zhur. eksp. i teor. fiz., 29, No 6(12), Dec 1955, 889-892

Title : A communication based upon the results of a work carried out in 1954 and earlier described in Otchet Instituta Yadernykh Problem AN SSSR (Reports of the Institute of Nuclear Problems, Acad. Sci. USSR). The authors propose here that the virtual process (N)→(N) + (μ,μ) (N: nucleon) takes place, as also indicated by others (e.g. R. E. Marshak, Mesons physics, 1952). They describe experimental arrangement, consisting of target, collimator, deflecting magnet, telescope of scintillation counters serving as monitor, telescope of proportional counters serving as detector of penetrating radiation, convertor, counter filled with BF_3, etc. They call attention to related work of B. Feld et alii (Phys. Rev., 96, 1386, 1954), noted just as they completed the work described here. They remark on the agreement of results. Eight references, all Western but one (cited above).

Institution: Institute of Nuclear Problems, Academy of Sciences USSR

Submitted : July 15, 1955



APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001342210002-6"

USSR/Physics - π^0 - mesons

Card 1/1 Pub. 22 - 16/59

Authors : Pontekorvo, B. M., and Selivanov, G. I.

Title : Formation of π^0 - mesons with neutrons

Periodical : Dok. AN SSSR 102/2, 253-256 May 11, 1955

Abstract : The results of experiments conducted with the help of the synchro-cyclotron of the Institute of Nuclear Problems are described. The experiments were

PONTEKORVO, B. M.

USSR/ Nuclear Physics

Card 1/1 Pub. 22 - 20/62

Authors : Pontekorvo, B. M., and Selivanov, G. I.

Title : Generation of π^0-mesons on hydrogen and deuterium by neutrons of 400 Mev (energy.)

Periodical : Dok. AN SSSR 102/3, 495 - 497, May 21, 1955

Abstract : The results of a series of experiments which were conducted in order to clarify process of π^0- meson formation are discussed. Neutrons of 400 Mev (nominally) obtained by impacts of protons with beryllium nuclei in a synchrocyclotron were used for the experiments. Eleven references: 4 USSR, and 7 USA (1951-1955).

Institution : The Acad. of Sc., USSR, Institute of Nuclear Problems

Presented by: Academician L. A. Artsymovich, April 24, 1955

PONTEKORVO, B.M.

USSR/ Physics - Nuclear cross section

Card 1/1 Pub. 22 - 12/46

Authors : Ignatenko, A. Ye; Mukhin, A. I.; Ozerov, E. B.; and Pontekorvo, B. M.

Title : Total cross-sections of the interaction between the negative π -mesons and hydrogen in the energy range from 140 up to 400 Mev

Periodical : Dok. AN SSSR 103/1, 45-47, Jul 1, 1955

Abstract : Experimental studies of the total cross-sections of the interactions between negative π -mesons and protons (hydrogen) are described. The experiments were conducted at the Institute of Nuclear Problems of the Acad. of Sc., USSR. Measurements of the cross-sections were carried out in the energy areas from 140-400 Mev. The measurements were conducted by the method of differences (CH_2-C). Five references: 2 USSR and 3 USA (1952-1954). Diagrams; table.

Institution : Acad. of Sc., USSR, Institute of Nuclear Problems

Presented by: Academician L. A. Artsymovich, May 17, 1955

PONTEKORVO, B.M.

USSR/ Physics - Nuclear physics

Card 1/1 Pub. 22 - 9/48

Author : Pontekorvo, B. M.; Abashkin, A. I.; Ageyeva, Yu. N.; and Dzhelepov, V. P.

Title : Full cross-sections of the interaction between negative π-mesons and deuterium in the energy region between 140 and 400 Mev.

Periodical : Dok. AN SSSR 103/2, 209-212, Jul 11, 1955

Abstract : Experiments intended to obtain more precise data on the full cross-section of negative π-mesons and deteurium reactions (π^-,d) are described. The experiments were conducted in the range of energy between 140 and 400 Mev. Ten references: 1 French, 3 USSR, and 6 USA (1952-1955). Tables; graphs.

Institution : The Acad. of Sc., USSR, Institute of Nuclear Physics

Presented by : Academician L. A. Artsimovich, May 17, 1955

Pontekorvo, B. M.

V8564 AERE-Lib/Trans-637

THE INTERACTION OF NEGATIVE π MESONS WITH NUCLEI OF BERYLLIUM, CARBON AND OXYGEN IN THE ENERGY RANGE FROM 140 TO 400 MEV. A. E. Ignatenko, A. I. Mukhin, E. B. Ozerov, and B. M. Pontekorvo. Translated by J. B. Sykes from Doklady Akad. Nauk S.S.S.R. 103, 395-7(1955). 4p.

Total reaction cross sections were determined by measuring the attenuation of a π^--meson beam under conditions of good geometry. Scintillation counters were used in the investigation. The resultant cross sections are tabulated and shown as a function of meson energy. (B.J.H.)

PONTECORVO, B., BLOKHINTSEV, D., and VEKSLER, V.

"Important Problems of Modern Physics," a chapter from the book Problems in the Utilization of Atomic Energy, the second revised edition of a collection of articles, published in 1956, Moscow, USSR

[illegible]

[illegible] and [illegible] (T/Ho)

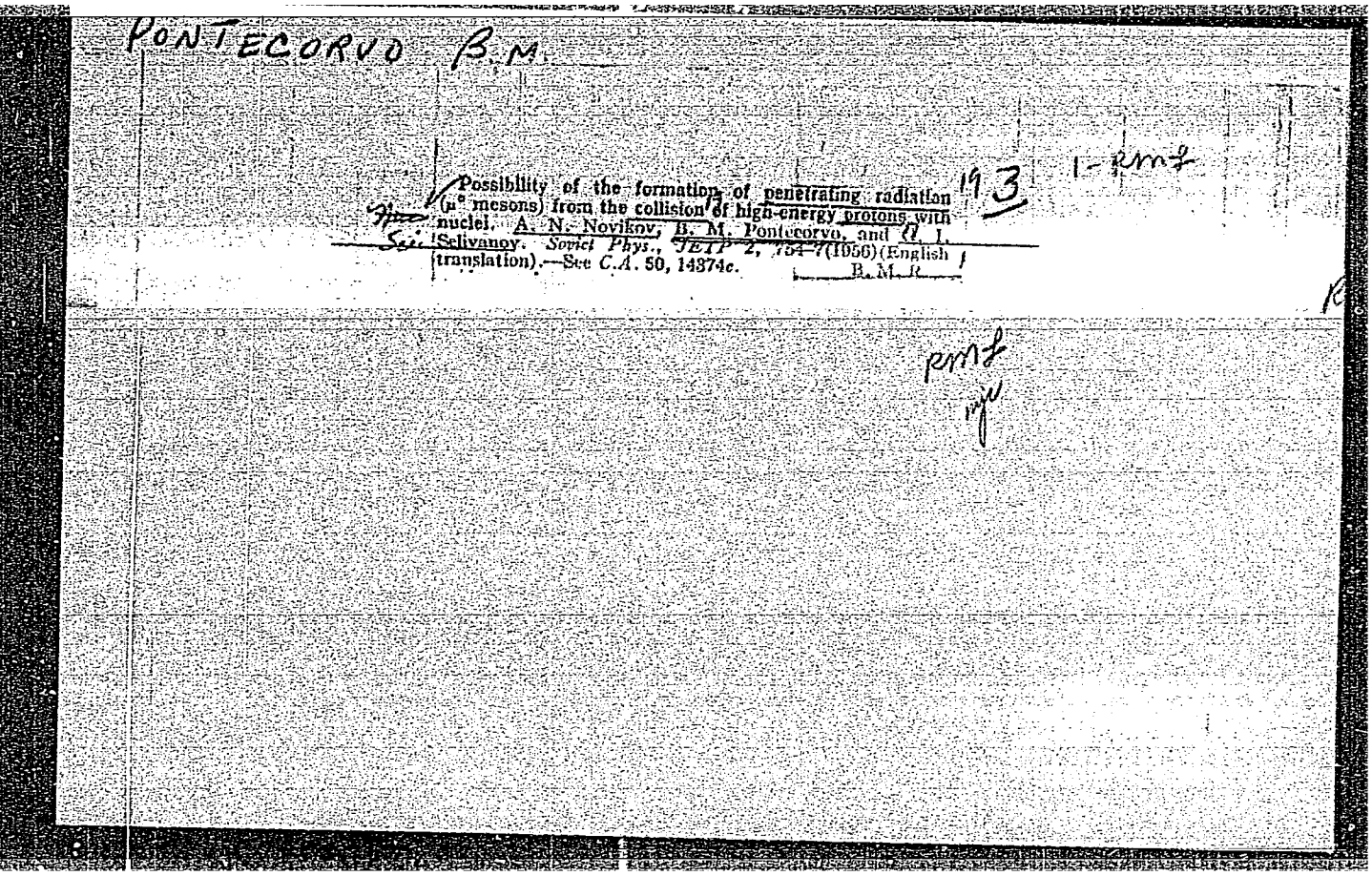
CERN-Symposium on High Energy Accelerators and Pion Physics

Geneva 11-23 June 56
ln. Branch #5

PONTEKORVO, B., VEKSLER, V., and BLOKHINTSEV, D.

"Important Problems of Contemporary Physics" an article in the publication Problems of the Use of Atomic Energy, Moscow, Oct 56

October 1956, Moscow



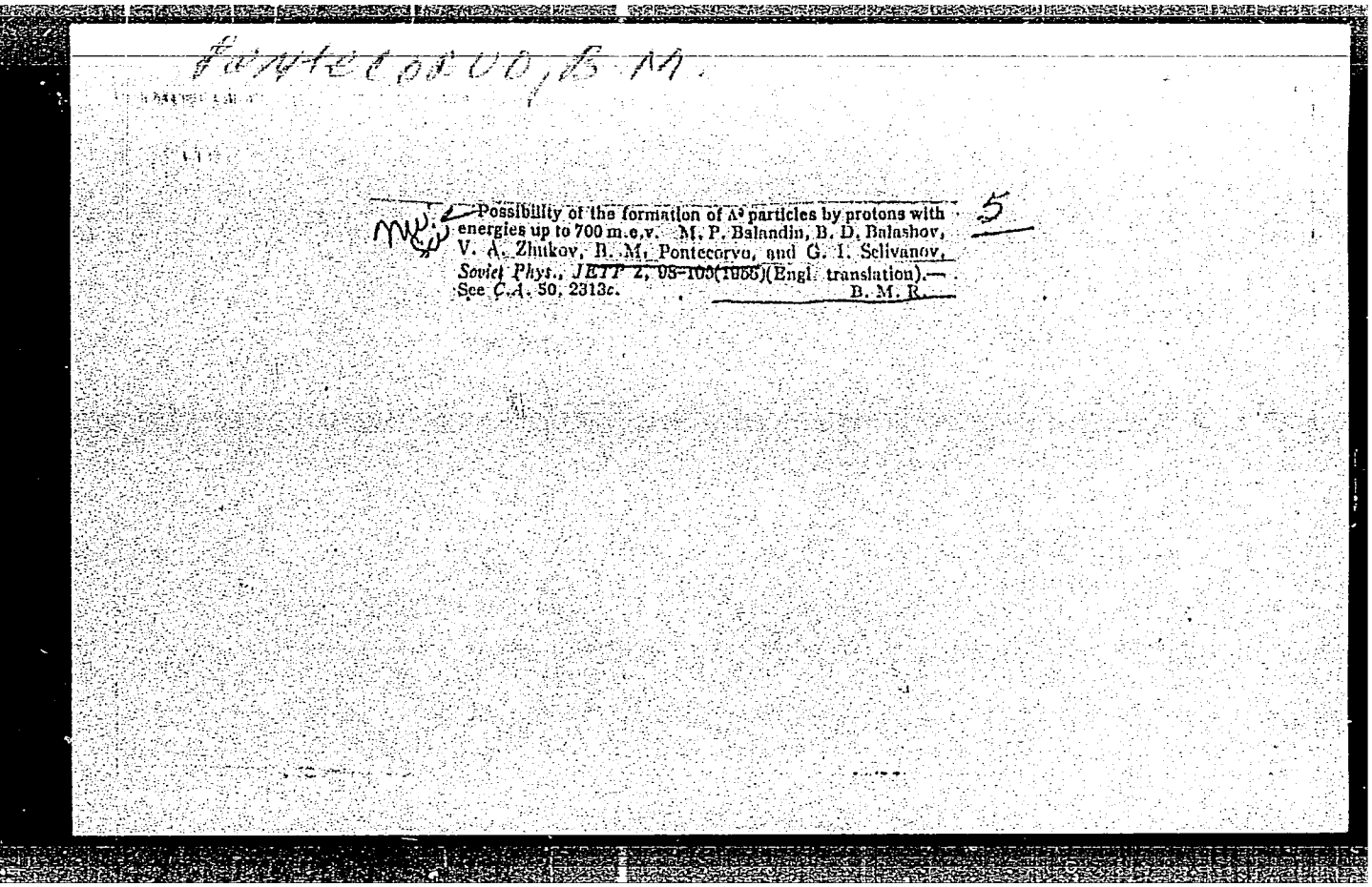
PONTECORVO B.M.

Possibility of the formation of penetrating radiation (μ^0 mesons) from the collision of high-energy protons with nuclei. A. N. Novikov, B. M. Pontecorvo, and Ya. L. Selivanov. *Soviet Phys., JETP* 2, 754–7 (1956) (English translation).—See *C.A.* 50, 14374c. B.M.P.

1953

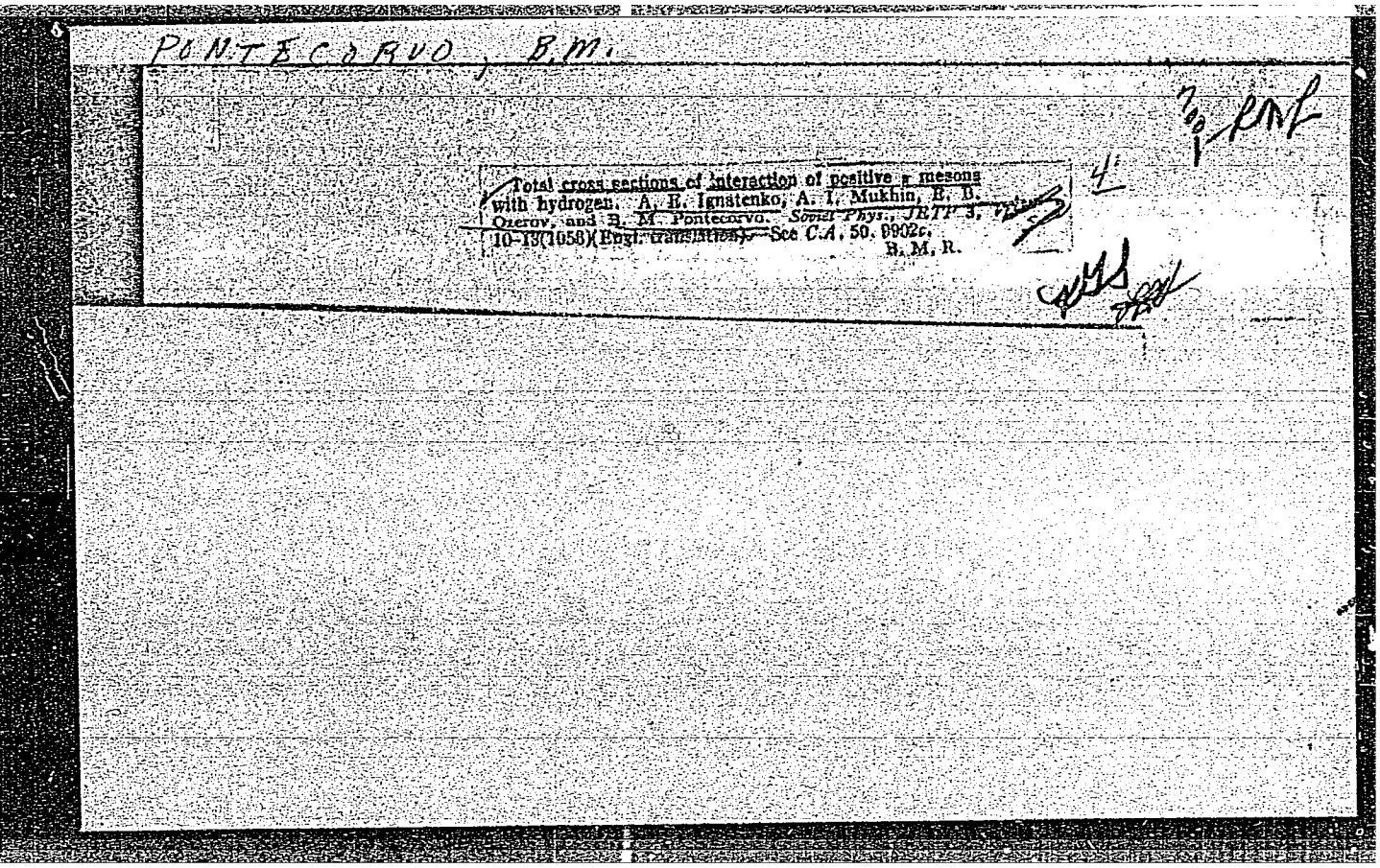
1-RM7

RM7



Fenteeo5 00,6 AA.

MW Possibility of the formation of Λ^0 particles by protons with energies up to 700 m.e.v. M. P. Balandin, B. D. Balashov, V. A. Zhukov, B. M. Pontecorvo, and G. I. Selivanov, *Soviet Phys., JETP* 2, 98-103(1956)(Engl. translation).— See C.A. 50, 2313c. B. M. R. 5



PONTECORVO, B.M.

Total cross sections of interaction of positive π mesons with hydrogen. A. E. Ignatenko, A. I. Mukhin, E. D. Ozerov, and B. M. Pontecorvo. *Soviet Phys.; JETP* 3, 10-13(1058)(Engl. translation). See *C.A.* 50, 9902c.
B. M. R.

PONTECORVO, B.M.

500

4

Total cross sections of interaction of positive π mesons with hydrogen. A. E. Ignatenko, A. I. Mukhin, E. B. Ozerov, and B. M. Pontecorvo. *Zhur. Eksptl. i Teoret. Fiz.* 30, 7-11(1950).—The total cross sections of interaction of pos. π mesons with H were detd. by attenuation in liquid H. From the combined measurements of total cross sections of π^+ mesons with H and with D a contribution to the cross section by states with different isotopic spin were obtained in the 140-230-m.e.v. region. The length of the scatterer was 28 cm., corresponding to the surface d. of H 1.07 g./sq. cm. In addn. to the previously described sector (*C.A.* 50, 7014e) Cherenkov detector, poly(methyl methacrylate) and polyethylene filters were used to absorb protons. Total uncertainty in energy measurements (including the slowing down of mesons in H, errors in measuring energy, and initial and max. probability of heterogeneity in the meson beam) was ±6 m.e.v. For π^+ mesons with energy (m.e.v.) 140 ± 7, 144 ± 6, 164 ± 6, 174 ± 6, 184 ± 6, 194 ± 6, 209 ± 16, 210 ± 6, 229 ± 6 the following total cross sections (mb.) were obtained, resp.: 133 ± 8, 151 ± 4, 169 ± 5, 193 ± 6, 190 ± 6, 200 ± 6, 170 ± 6, 160 ± 7, 132 ± 7.

A. P. Kutlobv

PONTEKORVO,B.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1751

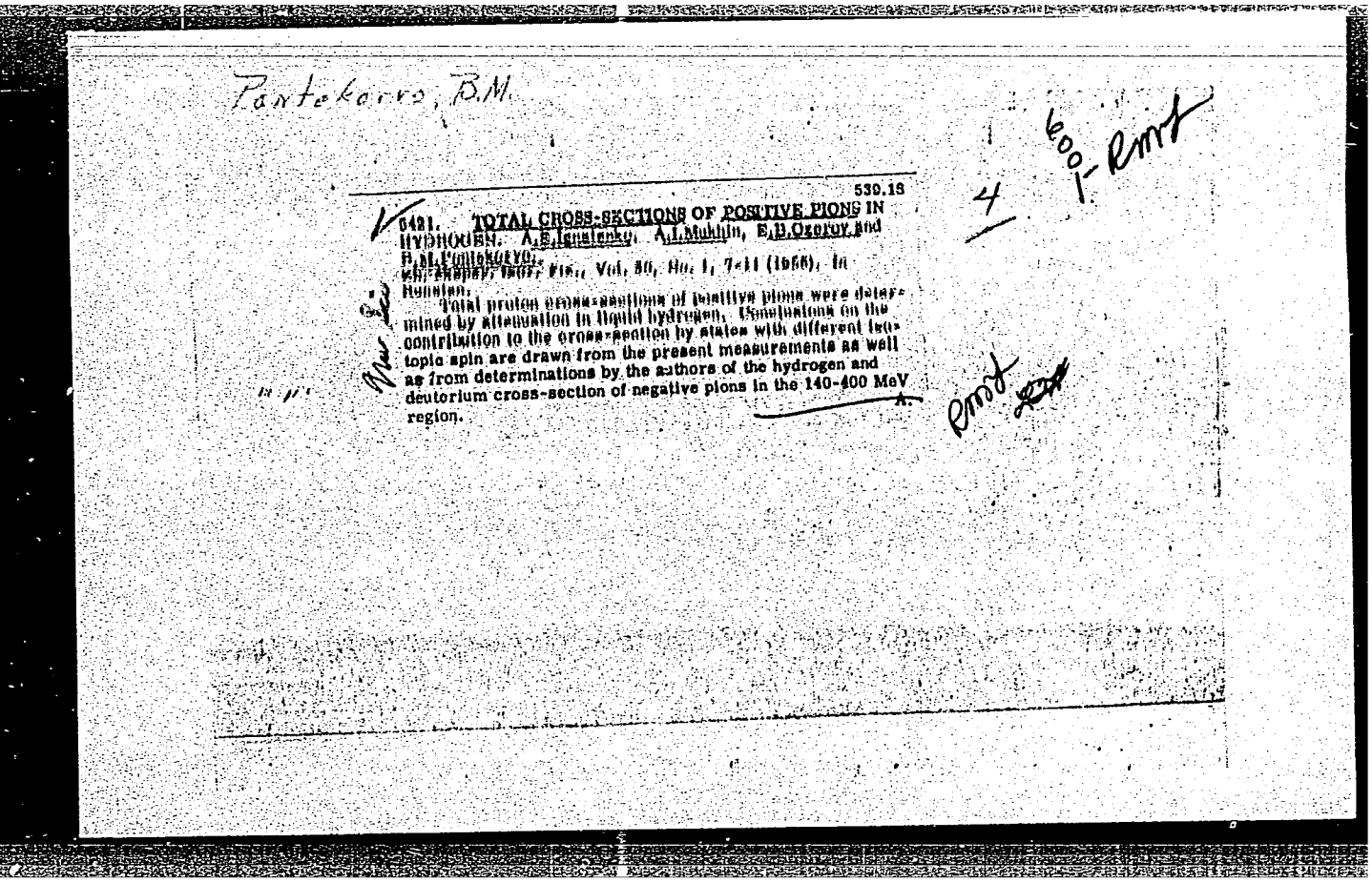
AUTHOR IGNATENKO,A.E., KRIVICKIJ,V.V., MUCHIN,A.I., PONTEKORVO,B., REUT,A.A., TARAKANOV,K.I.

TITLE The Leading-Out of Bundles of Energy-Rich Particles through the Pole Shoes of the Electromagnet of a Phasotron.

PERIODICAL Atomnaja Energija, 1, fasc.5, 5-8 (1956)
Issued: 1 / 1957

The present paper describes the method for the production of collimated pion bundles which was developed in the summer of 1953. On this occasion the pole shoes of the electromagnet serve as the main protection against the direct radiation of the accelerator. Apart from the economic advantage offered, the application of pole shoes as protection against radiation permits a considerable increase of the operation surface for investigations. In the 6 m phasotron of the Institute for Nuclear Problems of the Academy of Science in the USSR the properties of mesons are investigated on bundles which are led out not only through and between the pole shoes, but also through a specially built "principal concrete protection" of the phasotron. However, this concrete protection is comparatively far away from the chamber of the accelerator, and therefore the meson bundles led through the pole shoes are more intense than the bundles led out through the principal concrete protection.
The leading out of monoenergetic pion bundles through the pole shoes of the phasotron magnet is discussed on the basis of a drawing. The mesons produced by the bombardment of the target (arranged in the accelerator chamber) with 680 MeV

INSTITUTION:



Pontecorvo, B.M.

539.18

6421. TOTAL CROSS-SECTIONS OF POSITIVE PIONS IN HYDROGEN. A.E.Ignatenko, A.I.Mukhin, E.B.Ozerov and B.M.Pontekorvo. Zh. Eksper. Teor. Fiz., Vol. 30, No. 1, 7-11 (1956). In Russian.

Total proton cross-sections of positive pions were determined by attenuation in liquid hydrogen. Conclusions on the contribution to the cross-section by states with different isotopic spin are drawn from the present measurements as well as from determinations by the authors of the hydrogen and deuterium cross-section of negative pions in the 140-400 MeV region.

4

600 - Rmt

Rmt

PONTEKORVU, B.M.

USSR/Nuclear Physics C-3

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 11119

Author : Pantekorvo, B.M.

Inst : Not given

Title : Single-Meson and Mesonless Annihilation of Anti-Nucleons.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 5, 947-948

Abstract : The "ordinary" annihilation of anti-nucleons upon collisions with free nucleons or nuclei is accompanied by the emission of two or more π (or K) mesons. However, when anti-nucleons collide with nuclei, there is a possibility of "extraordinary" annihilation: single-meson for nuclei of atomic weight $A \geq 2$ and mesonless for nuclei with $A \geq 3$. The processes of "unusual" annihilation of anti-nucleons are processes that are the inverse of those in which anti-nucleons are created upon collision between

Card 1/2

C-3

USSR/Nuclear Physics

Abs Jour : Ref Zhur - Fizika, No 5, 1957, 11119

mesons or nucleons with nucleons. From the Fermi statistical theory of multiple creation of mesons it follows that the processes of the "unusual" annihilation are considerably less probable than the processes of "usual" annihilation. From the experimental point of view, particularly interesting is the reaction

$$p + d \rightarrow \pi^- + p,$$

since an investigation of the direct and inverse reactions makes it possible to check the correctness of the assumption that the spin of a negative particle with the proton mass equals 1/2.

Card 2/2

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1615
AUTHOR MUCHIN, A.I., OZEROV, E.B., PONTEKORVO, B.
TITLE The Scattering of π^+ - Mesons by Hydrogen. I. Angular Distribution at energies of 176, 200, 240, 270 and 307 MeV.
PERIODICAL Zurn.eksp.i teor.fis, 31, fasc.3, 371 - 385 (1956)
Issued: 12 / 1956

The present report contains an exact discussion of the results obtained by A.I. MUCHIN, E.B. OZEROV, B. PONTEKORVO (report of the Institute for Nuclear Problems of the Academy of Sciences of the USSR, 1955, lectures delivered on the All Soviet Conference on the Physics of high-energy particles, 14 - 22 May 1956) concerning the scattering described in the above title. Measuring was carried out by means of scintillation counters. The bundles of positive pions were produced by the bombardment of a polyethylene target by the proton bundle leaving the synchro-cyclotron. The corresponding reaction is $p + p \rightarrow \pi^+ + d$.

Test order: For measuring angular distributions a ČERENKOV detector and liquid-scintillation-counters were used, which were connected in coincidence for the registration of positive pions inciding upon the hydrogen target. The total cross sections of the interaction between positive pions and hydrogen were measured from the decrease of intensity of the meson bundle passing through the hydrogen scatterer. There follows a discussion of measurements carried out.

Measuring results: Measuring results are shown in tables. The differential cross sections in the laboratory system and in the center of mass system and, in addition,

PONTECORVO, B.

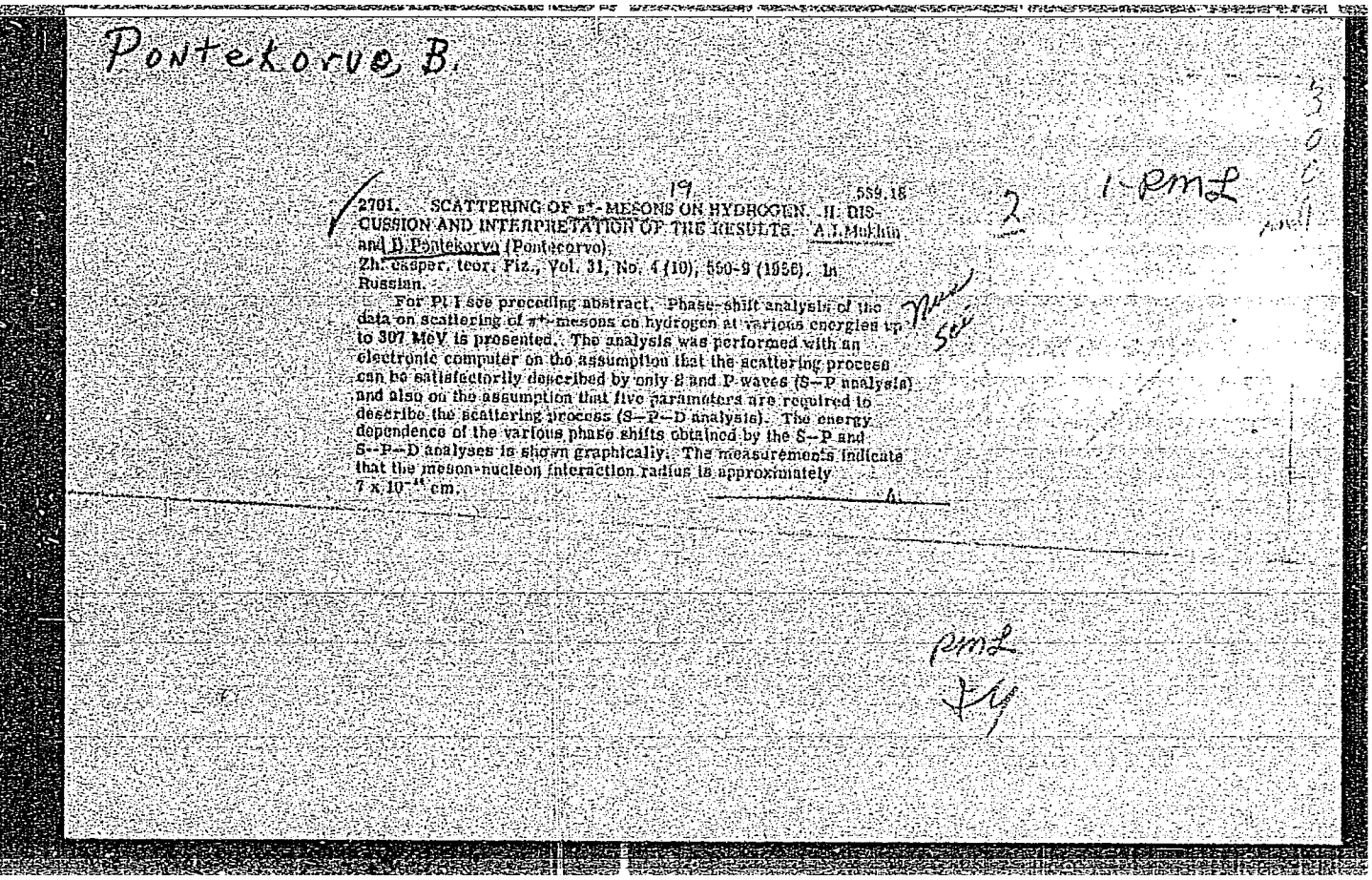
ZHURNAL EKSPERIMENTALNOI I TEORTICHESKOI FIZIKI

Vol 31, Nr 4 (10), 1956 p. 545-9

INTERACTION OF π^--MESONS WITH LEAD, COPPER, CARBON AND BERYLLIUM NUCLEI

A. E. Ignatenko, A. I. Mukhin, E. B. Ozerov, B. Pontecorvo

The total interaction cross sections σ_t for π^--mesons on Be, C and O nuclei and the cross section σ_{in} for inelastic collisions of π^--mesons with Be, C, Cu and Pb nuclei in the 140–400 MeV energy range have been measured. The cross sections were determined by scintillation counter measurements of the attenuation of a flux of mesons passing through a scatterer. As a whole the energy dependence of σ_t and σ_{in} resembles the energy dependence of the total π-meson scattering cross section on hydrogen and deuterium. The results of measurement of the cross sections are analyzed with the optical model. It can be concluded from the analysis that an optical model with parameters computed on the basis of the single nucleon mechanism of interaction between π^--mesons and nuclei satisfactorily describes the energy dependence of the cross sections in the 140—400 MeV energy range.



Pontekorvo B.

2701. SCATTERING OF π^+-MESONS ON HYDROGEN. II. DISCUSSION AND INTERPRETATION OF THE RESULTS. A.I. Mukhin and B. Pontekorvo (Pontecorvo). Zh. eksper. teor. Fiz., Vol. 31, No. 4 (10), 550-9 (1956). In Russian. 19 559.16

For PI I see preceding abstract. Phase-shift analysis of the data on scattering of π^+-mesons on hydrogen at various energies up to 307 MeV is presented. The analysis was performed with an electronic computer on the assumption that the scattering process can be satisfactorily described by only S and P waves (S--P analysis) and also on the assumption that five parameters are required to describe the scattering process (S--P--D analysis). The energy dependence of the various phase shifts obtained by the S--P and S--P--D analyses is shown graphically. The measurements indicate that the meson-nucleon interaction radius is approximately 7×10^{-14} cm.

PONTECORVO, B.

MESONIUM AND ANTIMESONIUM. B. Pontecorvo. Translated from a publication of the Joint Inst. for Nuclear Research, U.S.S.R. 1957. 7p.

Since Gell-Mann and Pais pointed out that K^0 and $\bar{K}^0$ particles are not identical, the possibility of $K^0 \rightleftarrows \bar{K}^0$ transitions induced by weak interactions makes it necessary to consider neutral K mesons as a mixture of particles of different parity. The question of the existence of other mixed neutral particles is discussed, (not necessarily elementary ones) which are not identical to the corresponding antiparticles, and for which particle-antiparticle transitions are not strictly forbidden. The number of possible systems are strongly limited by conservation laws for the number of barions and high fermions. Thus, apparently mesonium defined as the bound system (μ^+,π^-) is the only other mixed particle of interest existing among well known systems. These mesonium $\rightleftarrows$ antimesonium transitions are not forbidden and must take place due to known transitions. However, the mesonium-antimesonium transformation in the presence of matter is impossible. The probability (in vacuum) of emission of a fast positive or negative electron in the decay process, $[(\mu^+e^-) \rightarrow (\mu^-e^+) \rightarrow e^- \text{fast} + \nu + \bar{\nu} + e^+]$ is ~ 1 and $\sim \frac{1}{4}(\tau/\eta)^2$ respectively, when τ is the lifetime of a μ meson and η is the time characterizing this transformation. (N.H.R.)

3

1-RMH
1-GWM
1-4E32

RMH

PONTEKORVO, B., CHESTNOY, A.Y., DZHELEPOV, V.P., DMITRYEVSKIY, V.P., KATYSHEV, V.S. KOZODAYEV, M.S., MESHCHERYAKOV, M.G.

"High Energy Particle Beams from the Six Metre Synchrocyclotron and their Utilization," paper presented at CERN Symposium, 1956, appearing in Nuclear Instruments, No. 1, pp. 21-30, 1957

PONTEKORVO, MUKHIN, A.I., OZEROV, E.B., GRIGORYEV, E.L., MITIN, N.A.

"Positive Pion-Proton Scattering at Energies 176, 200, 240, 270, 307 and 310 MeV," paper presented at CERN Symposium, 1956, appearing in Nuclear Instruments, No. 1, pp. 21-30, 1957

PONTECORVO, B.M.

4030

ONE-MESON AND ZERO-MESON ANNIHILATION OF ANTINUCLEONS. B. M. Pontecorvo. Soviet Phys: JETP 3, 966-7(1957) Jan.

The possibility of antinucleon annihilation processes, in which the number of π mesons emitted is one or zero, is considered for the case where antinucleons collide with nucleons bound to a nucleus. (B.J.H.)

Pontekorvo, B.M.

89-11-6/9

AUTHORS: Dzhelepov, V.P., Pontekorvo, B.M.

TITLE: Studies in High -Energy Particle Physics Made in the Synchro-Cyclotron at the Laboratory for Nuclear Problems of the United Nuclear Research Institute. (Issledovaniya po fizike chastits vysokikh energiy na sinkhrotsiklotrone Laboratorii yadernykh problem Ob"yedinennogo instituta yadernykh issledovaniy)

PERIODICAL: Atomnaya Energiya, 1957, Vol. 3, Nr 11, pp. 413-443 (USSR)

ABSTRACT: Achievements attained by soviet physicists in the field of the physics of high-energy particles are described in detail. This summarizing report supplies information on the following items:
1) Initiation of the synchro-cyclotron and the ray characteristics
2) Reconstruction of the accelerator and present efficiency.

Particles to be accelerated and their energies:

	deuterons	α-particles	protons
Current on the inner target in	1	o,o25	o,2-o,3
Beam density 1o m distant from the channel in cm^{-2}, sec^{-1}	--	---	$1 . 1o^6$ (E_p=46o MeV)
Neutron density in the maximum of the angular distribution, 2m distant from the inner targent in cm^{-2}, sec^{-1}	$8.1o^7$	$2.1o^5$	$5.1o^6$

4) Elastic scattering of nucleons on nucleons.
a) p-p-scattering and polarization of protons occurring on this occasion

Card 1/4

Card 2/4

Studies in High-Energy Particle Physics Made in the Synchro- 89-11-6/9
Cyclotron at the Laboratory for Nuclear Problems of the United Nuclear Research Institute.

b) n-n-scattering
c) n-p-scattering
d) "exchange" scattering of neutrons on deutrons
e) p-d-scattering and direct production of deuterons by protons (from light nuclei)
f) total effective cross section of the nuclear interaction of nucleons with nucleons and deuterons

5) Interaction of mesons and nucleons
a) scattering of π-mesons on nucleons and complexe nuclei
b) production of mesons by nucleons
c) Meson production process as dependent on energy, and the angular distribution of mesons
d) energy spectra of the particles developing on the inelastic collision of two nucleons
e) production of π-mesons by mesons
f) μ-mesons
g) "strange" particles
h) interaction of high-energy particles with complexe particles

6) Methods of investigation and apparatus

There are 41 illustrations, 2 tables and 121 Slavic references

Card 3/4

Card 4/4

PONTECORVO, B.

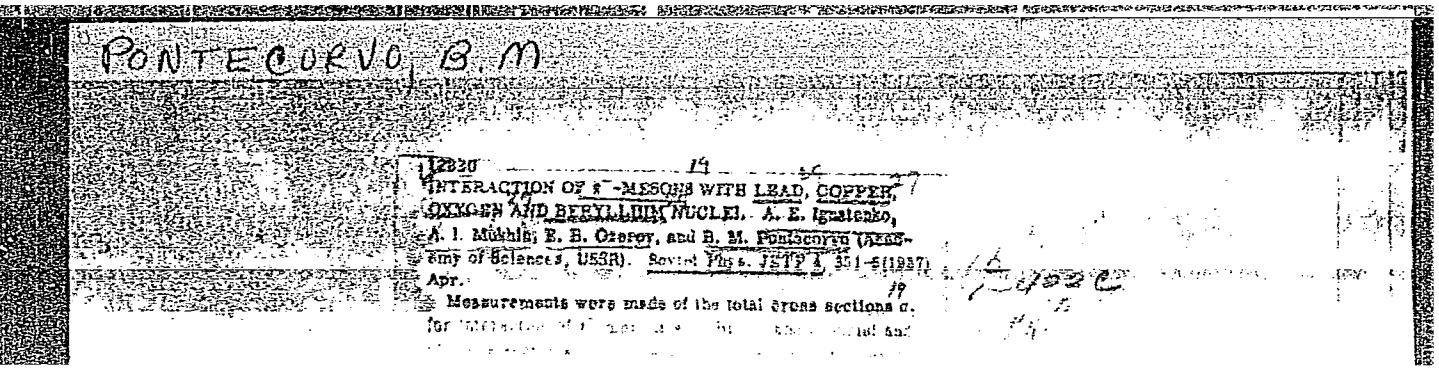
6 refs

5666 19 19

THE SCATTERING OF π^+-MESONS ON HYDROGEN. I. ANGULAR DISTRIBUTIONS AT ENERGIES OF 176, 200, 240, 270, AND 307 MEV. A. I. Mukhin, E. B. Ozerov, and B. Pontecorvo (Academy of Sciences, USSR). Soviet Phys. JETP 4, 237-50(1957) March.

The angular distribution of π^+ mesons with energies of 176, 200, 240, 270 and 307 Mev scattered from liquid hydrogen has been studied with the help of scintillation counters. The total interaction cross section π^+ mesons and hydrogen has also been measured by the method of attenuation of the beam. At all energies, except 307 Mev, the data can be well described by a function of the form $d\sigma/d\Omega = a + b \cos\theta + c \cos^2\theta$. (auth)

refs

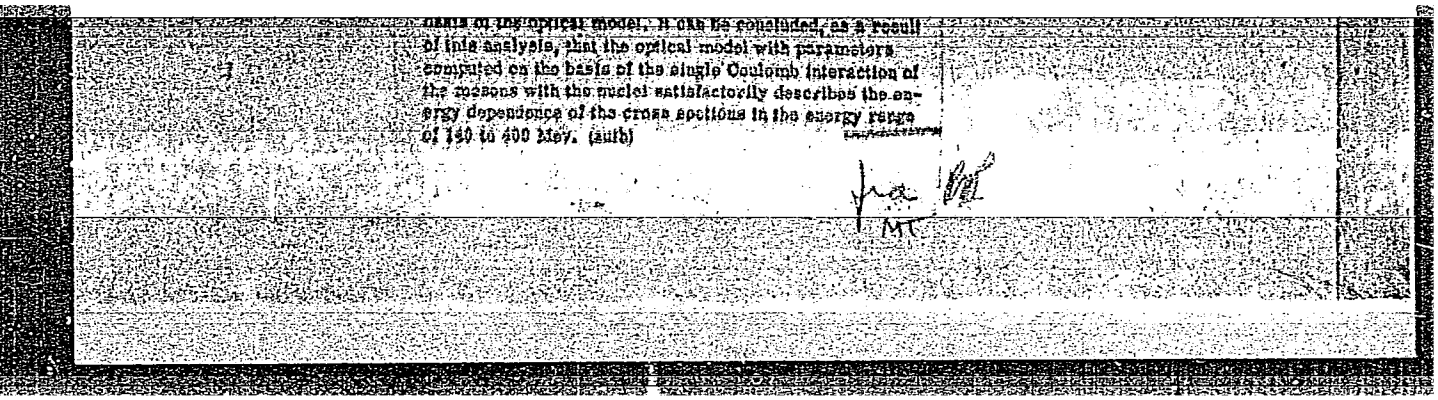


PONTECORVO, B. M.

12830 14

INTERACTION OF π^--MESONS WITH LEAD, COPPER, OXYGEN AND BERYLLIUM NUCLEI. A. E. Ignatenko, A. I. Mukhin, E. B. Ozerov, and B. M. Pontecorvo (Academy of Sciences, USSR). Soviet Phys. JETP 4, 351-6(1957) Apr.

Measurements were made of the total cross sections σ. for [illegible]



basis of the optical model. It can be concluded, as a result of this analysis, that the optical model with parameters computed on the basis of the single Coulomb interaction of the nucleons with the nuclei satisfactorily describes the energy dependence of the cross sections in the energy range of 140 to 400 Mev. (auth)

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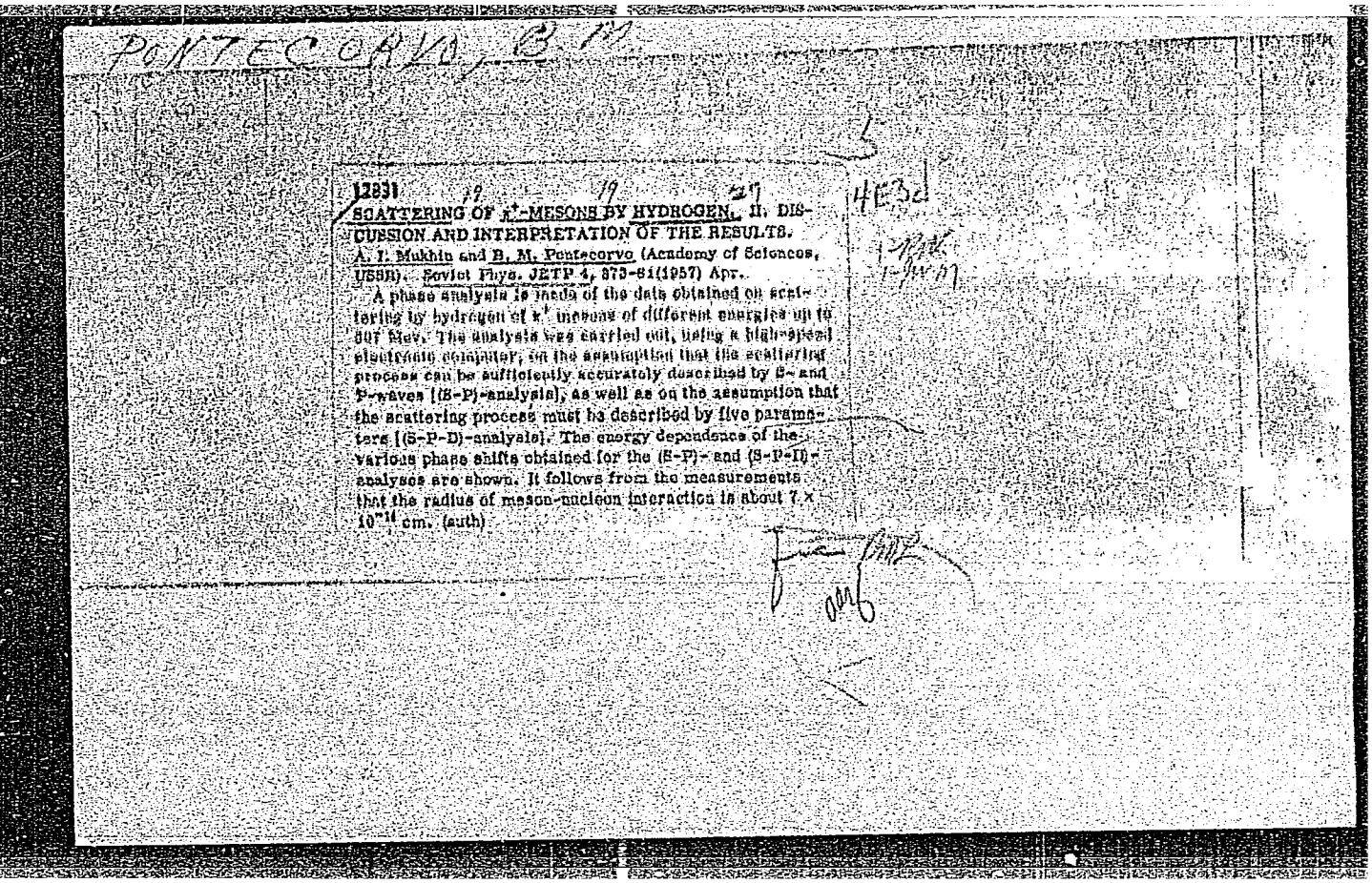

PONTECORVO, B. M.

12831 19 19 27

SCATTERING OF π^+-MESONS BY HYDROGEN. II. DISCUSSION AND INTERPRETATION OF THE RESULTS.

A. I. Mukhin and B. M. Pontecorvo (Academy of Sciences, USSR). Soviet Phys. JETP 4, 373-81(1957) Apr.

A phase analysis is made of the data obtained on scattering by hydrogen of π^+ mesons of different energies up to 307 Mev. The analysis was carried out, using a high-speed electronic computer, on the assumption that the scattering process can be sufficiently accurately described by S- and P-waves [(S-P)-analysis], as well as on the assumption that the scattering process must be described by five parameters [(S-P-D)-analysis]. The energy dependence of the various phase shifts obtained for the (S-P)- and (S-P-D)-analyses are shown. It follows from the measurements that the radius of meson-nucleon interaction is about 7×10^{-14} cm. (auth)

DZELEPOV, V.P. [Dzhelepov, V.P.]; PONTECORVO, B.M.

Research on high-power particle physics made on synchrocyclotron at the Nuclear Problem Laboratory of the Joint Nuclear Research Institute. Jaderna energie 3 no.11:340-370 '57.

PONTECORVO, B.

9149

THE EXTRACTION OF HIGH-ENERGY PARTICLE-BEAMS THROUGH THE YOKE OF THE SYNCHROCYCLOTRON ELECTROMAGNET. A. E. Ismatenko, V. V. Krivitsky, A. I. Mukhin, B. Pontecorvo, A. A. Rust, and K. I. Tarakanov. J. Nuclear Energy 5, No. 1, 57-61(1957).

A method is described for obtaining collimated beams of high-energy particles, in particular π mesons, based on the use of the electromagnet yoke as the main shield from the direct radiation of the accelerator. By placing collimators in channels drilled in the electromagnet yoke, beams of π mesons with energies up to 400 Mev have been obtained. (auth)

Pontekorvo, B.

PA - 2708

AUTHOR DANYSH M., PONTEKORVO B.,

TITLE The Threshold of the "Creation" and the Threshold of the "Generation" of Negative K -Mesons.
(Porog "rozhdeniya,i porog "generatsii" otritsatel'nykh K-meonov-Russian)

PERIODICAL Zhurnal Eksperim.i Teoret.Fiziki,1957,Vol 32,Nr 2,pp 398-399,(U.S.S.R.)
Received 5/1957 Reviewed 6/1957

ABSTRACT The present work reports some details on the properties of charged K-mesons,which, though resulting immediately from the deliberation by PAIS and PICCIONI, does not occur in an explicit form in published works. Besides, the authors suggest a variety of the test undertaken by PAIS and PICCIONI which, according to their opinion, is more simple than the tests described in various publications. At first the production process of negative K-mesons is discussed. While the threshold of the production of K^+-mesons is about ~1580 MeV, the threshold of the production of K^--mesons amounts to ~2500 MeV. However, an exact analysis of the deliberation made by PAIS and PICCIONI on the properties of the θ^0-mesons easily shows that K^--mesons can be obtained also by means of a bundle of nucleus or pions which have energies that are less than the "generation value" of K^--mesons,i.e. the energy of the nucleons or pions is below the generationthreshold of a pair of K-particles. Thus, the threshold of the "generation" of K-mesons in "thick spatial" targets is lower than their "generation cross section". Because of the fairly long life of the K-mesons, they may be observed at great distances from the (specially constructed) target of the synchrophasotron in the experimental arrangement

Card 1/2

AUTHOR: OKUN', L., PONTEKORVO, B.

56-6-52/56

TITLE: Some Notes on the Slow Transition Processes of Elementary Particles (Nekotoryye zamechaniya o medlennykh protsessakh prevrashcheniya elementarnykh chastits. Russian)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 6, pp 1587 - 1588 (U.S.S.R.)

ABSTRACT: As is known, two types of slow processes exist:

a) Lepton processes: $n \to e + \bar{\nu} + p$, $\mu \to e + \nu + \bar{\nu}$, $\mu + p \to n + \nu$, $\pi \to \mu +$, $K \to \mu + \nu$, $K \to \mu + \nu + \pi$, $K \to e + \nu + \pi$.

b) Processes not connected with leptons:

$K \to 2\pi$, $K \to 3\pi$, Λ (Σ) $\to N + \pi$, $\Xi \to \Lambda + \pi$.

The constants of the interaction responsible for these processes in the units ($\hbar = c = \mu = 1$, where μ denotes the mass of pions) are nearly of the same order of magnitude $G^2 \sim 10^{-14} - 10^{-15}$. This leads to the opinion that all these processes are based upon one and the same mechanism, i.e. a universal FERMI interaction. This idea is confirmed by the fact that for all these processes parity is not conserved. Perhaps the processes a) and b) are processes of second order with respect to neutrino interaction. Naturally, also other schemes are conceivable which

Card 1/2

PONTEKORVO, B.

56-2-43/47

AUTHOR Pontekorvo, B.

TITLE The Mesonium and the Antimesonium. (Mezoniy i antimezoniy.)

PERIODICAL Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol. 33, Nr 2(8), pp. 549-551 (USSR)

ABSTRACT First, reference is made in short to some previous papers dealing with the same subject. The present paper investigates the problem as to whether, besides the K^0-mesons, there are other "mixed" particles. (These particles must not necessarily be elementary particles). The transitions particle-antiparticle are here not considered to be strictly forbidden. The only particle that is of interest in this respect is the mesonium, which is defined as a coupled system $(\mu^+ e^-)$. The antimesonium, i.e. the system $(\mu^- e^+)$, shows a distinct difference from the mesonium. The transitions mesonium-antimesonium are here not forbidden by any known laws, and they are even bound to take place on the basis of the known interactions. The transitions

$$(\mu^+ e^-) \rightarrow (\nu + \tilde{\nu}) \rightarrow (\mu^- e^+)$$

are caused by the same interaction as in the case of the

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actions, it holds that $g \sim 3 \cdot 10^{-49}$ erg·cm^3 and $T \sim 5 \cdot 10^{-4}$,

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i.e. T is then only about 3 times as great as τ.
Unfortunately, the transition mesonium → antimesonium is impossible in matter because of the asymmetric of the nucleons. The masses of the mesonium and antimesonium are, under these circumstances, no longer equal.
In conclusion, the probabilities are written down for the fact that, with decay in the vacuum, a fast positive or negative electron is emitted.
There are no figures.

ASSOCIATION: United Institute for Nuclear Research. (Ob"yedinennyy institut yadernykh issledovaniy.)

SUBMITTED: May 23, 1957.
AVAILABLE: Library of Congress.

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Pontekorvo B. M.

MUKHIN, A. I., OSEROV, E. B., and PONTEKORVO, B. M.

"Energy Dependence of the β Asymmetry in $(\pi^+ - e^+)$ Decay,"

paper presented at Annual International Conference on High Energy Physics, CERN, Geneva, 30 Jun - 5 Jul 58.

PONTEKORVO B. M.

56-1-47/56

AUTHOR: Pontekorvo, B.

TITLE: The Inverse β-Processes and the Nonconservation of the Lepton Charge (Obratnyye β-protsessy i nesokhraneniye leptonnogo zaryada)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 1, pp. 247 - 249 (USSR)

ABSTRACT: The author recently discussed the problem (reference 1) whether other "mixed" neutral particles also exist beside the K^o-mesons. These particles differ from the corresponding antiparticles, where the transitions particles-antiparticles are not strictly prohibited. The possibility was pointed out that the neutrino could be such a mixed particle and that consequently real transitions neutrino $\rightleftarrows$ antineutrino in a vacuum would be possible when the law of the conservation of the lepton charge (neutrino charge) is no longer valid. The present paper more closely investigates this possibility which gained in interest with the new experimental results on the inverse β-processes. According to the experimental results by R. Davis (reference 4) there exists no strict law of conservation of the neutrino charge. The author assumes the following here: The neutrino (ν) or antineutrino ($\tilde{\nu}$) respectively emitted in the processes $p \rightarrow n + \beta^+ + \nu$ and $n \rightarrow p + \beta^- + \tilde{\nu}$ re-

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The Inverse β-Processes and the Nonconservation of the Lepton Charge

spectively are no identical particles. There is no strict law of conservation of the neutrino charge either. Then processes of the type $p \rightarrow n + \beta^+ + \tilde{\nu}$, $n \rightarrow p + \beta^- + \nu$ are possible, but they are less probable than the first-mentioned processes. The physical cause for the distinguishability of the neutrino and the antineutrino is not discussed here. According to the assumptions given here the neutrino can in a vacuum be converted to an antineutrino and inversely. According to this the neutrino and the antineutrino are "mixed" particles, i.e. they are the symmetric and the antisymmetric combination of two really neutral Majorana (Mayorana)-particles ν_1 and ν_2 which have different combined parities. The possibility mentioned here does, however, not simplify the theory of the β-decay and besides it probably does not correspond to reality. Nevertheless it is discussed here, because the conclusions obtained from it can be experimentally checked. Thus, e.g. the current of neutral leptons (which mainly consists of antineutrinos) coming out of a nuclear reactor will already in a certain distance from the reactor consist half of neutrinos and half of antineutrinos. Perhaps there also exists a direct interaction which is responsible for the conversion neutrino → antineutrino $\nu \rightarrow (\tilde{\nu} + N + \tilde{N}) \rightarrow \tilde{\nu}$. There are 10 references, 5 of which are Slavic.

ACCESSION NR: AT4019688 S/2555/63/009/000/0132/0156

AUTHOR: Pontekorvo, B.

TITLE: The neutrino and its role in astrophysics

SOURCE: AN SSSR. Astronomicheskiy sovet. Voprosy* kosmogonii (Problems of cosmogony), v. 9, 1963, 132-156

TOPIC TAGS: neutrino, astrophysics, astronomy, neutrino physics, antineutrino, star, neutrino-antineutrino pair, neutrino-electron scattering, star evolution, cosmogony, sun, solar physics, cosmic ray

ABSTRACT: The status of investigation of the neutrino in astrophysics to mid-1962 is reviewed. The first part of the article discusses the current status of neutrino physics. The principal properties of neutrinos are summarized in Table 1. Unsolved problems in neutrino physics are discussed. The second part of the article deals with the role of neutrinos in astrophysics. The sun and main sequence stars emit neutrinos only, not antineutrinos. The energy associated with neutrino emission in such stars is of the order of a few percent. At some stageiin their evolution the heavier stars emit neutrino-antineutrino pairs as a result of various mechanisms which all are related to the neutrino-

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ACCESSION NR: AT4019638

electron scattering process, which is predicted by theory but which has not yet been observed in the laboratory. Neutrinos may play an important role in cosmogony. The future outlook for neutrino astrophysics is discussed; detection of solar neutrinos is a leading problem. The review is divided into the following parts: 1. Introduction. 2. Known properties of neutrinos. 3. Physics of high energy neutrinos. 4. Is there a four-fermion interaction with primaries? 5. Are ν_e and ν_μ identical particles? 6. Is there an anomalous ν_μ-N interaction? 7. Is there a ν - e interaction? 8. Are there neutral currents in weak interactions? 9. Certain remarks on macroscopic effects associated with neutrinos. 10. Neutrinos and the sun. 11. Emission of neutrino-antineutrino pairs associated with electron-neutrino interactions. 12. The URCA process. 13. Neutral currents and astrophysics. 14. Neutrinos and cosmogony. 15. Experimental neutrino astronomy. Conclusion. Orig. art. has: 15 formulas, 2 tables and 3 figures.

ASSOCIATION: Astronomicheskiy sovet AN SSSR (Astronomical Council)

SUBMITTED: 00Aug62 DATE ACQ: 12Mar64 ENCL: 00

SUB CODE: AS, PH NO REF SOV: 005 OTHER: 005

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21 (0)

AUTHORS: Mukhin, A. I., Ozerov, Ye. B., Pontekorvo, B.

SOV/56-35-2-5/60

TITLE: The Energy Dependence of Asymmetry in μ^+-e^+-Decay (Energeticheskaya zavisimost' asimmetrii v μ^+-e^+-raspade)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 2, pp 340-347 (USSR)

ABSTRACT: For the investigation of the asymmetry of electrons produced during the decay of polarized μ-mesons the authors developed an experimental system which is described in the following. The π-meson bundles used for the experiments are from a synchrocyclotron, the energy of the π-mesons amounted to ~80 MeV, and intensity amounted to 100 mesons/cm^2 sec. The experimental arrangement consisted of a shielding wall, a collimator with a beryllium filter in the gap, before it the two monitor counters (between the counters there is a polyethylene filter of 10 cm thickness), the graphite target (with magnetic shield), and of a telescopic arrangement of scintillation counters with CH_2-filters. The results

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obtained by the investigations (π-μ-e-decay) are represented in form of 2 diagrams. (Figure 3 shows the absorption of the electrons originating from the decay of unpolarized μ^+-mesons; figure 4 shows the dependence of the asymmetry-coefficient on electron energy). The qualitative results of the energy dependence agree (with a margin of some few %) with those predicted by the two-component neutrino theory. The degree of polarization of the μ mesons was determined as amounting to 0.81 ± 0.11. There are 4 figures and 14 references, 2 of which are Soviet.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (United Institute of Nuclear Research)

SUBMITTED: March 3, 1958

PONTEKORVO, B M.

53-1-2/8

AUTHORS: Dzhelepov, V. P., Pontekorvo, B. M.

TITLE: The Investigations Dealing With the Physics of Particles With High Energy at the Synchrocyclotron of the Laboratory for Nuclear Problems of the United Institute for Nuclear Research (Issledovaniya po fizike chastits vysokikh energiy na sinkhrotsiklotrone Laboratorii yadernykh problem Ob"yedinennogo instituta yadernykh issledovaniy)

PERIODICAL: Uspekhi Fizicheskikh Nauk, 1958, Vol. 64, Nr 1, pp. 15-54 (USSR)

ABSTRACT: This work attempts to give an idea of the basic scientific research work on particles of high energy, which was performed by the Soviet scientists at the synchrocyclotron, mentioned in the title, which is the largest one in the world. This detailed report, which is supplied with many figures and diagrams, is arranged as follows: The starting up of the synchrotron and the characterization of the beam of high-energy particles; the designing of the accelerator and the present state; some experimental investigations with the 680 MeV-deuterons and with a particles with the energy of

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